

Changing the Project Execution Culture at NASA Dryden

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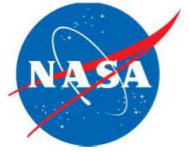
Edwards, California

Outline



- The Dryden Project Environment
- Former Cultural State
 - The need for change
- Desired Cultural State
 - Change description
 - Critical Chain Project Management Philosophies
- The Challenges
 - Management Attention: Help or Punishment?
 - Synchronizing vs. Micromanagement
 - Focus on Minutia: Paralysis by Analysis
 - Phased Implementation: Change Schizophrenia
 - Long Term Attention: Organizational Attention Deficit Disorder
- Current State
- Conclusion

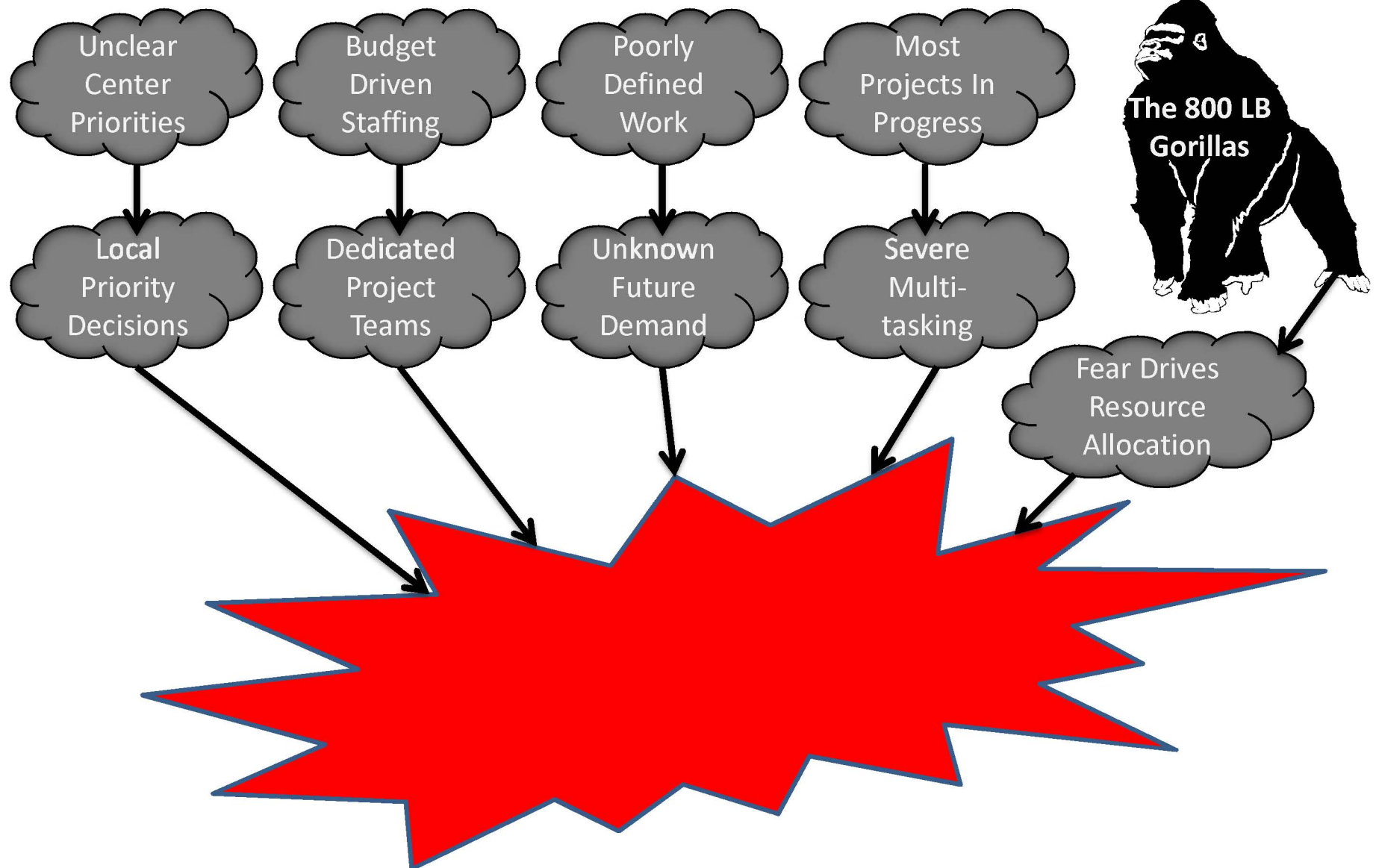
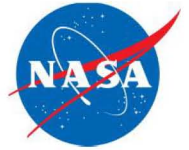
The Dryden Project Environment

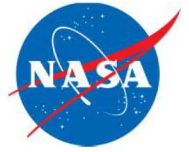


- A small Center
 - ~550 civil service
 - ~600 support contractors
- Multiple projects from multiple customers
 - Aeronautics Research Mission Directorate
 - Science Mission Directorate
 - Human Exploration & Operations Mission Directorate
 - Office of the Chief Technologist
 - Non-NASA
- 40+ active projects of widely varying sizes
 - Small analysis or ground test efforts (<5 WFE)
 - Large, multi-year, flight research efforts (up to ~50 WFE)



Former Cultural State

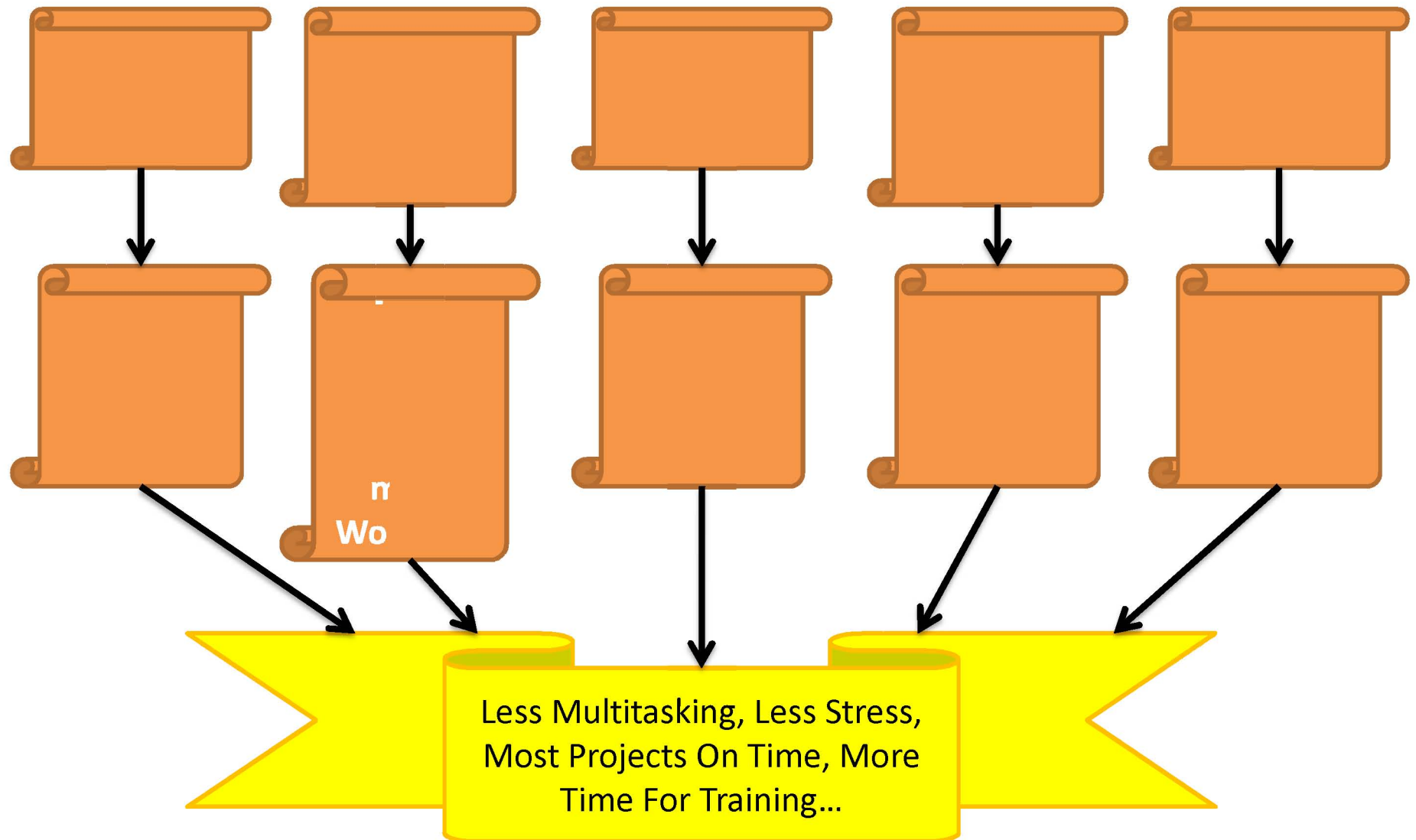




The Change

- Implementation of Critical Chain Project Management Tools & ***Philosophies***
 - Fundamental shift in center management and project execution philosophies
- Goals
 - Reduce multitasking
 - Reduce workforce stress
 - Improve on-time performance
 - Improve time for training, R&D, infrastructure improvement, etc.
- No significant change in size of center workforce

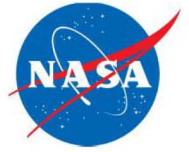
Desired Cultural State



THE CHALLENGES



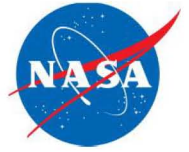
Management Attention: Help or Punishment



- Issue: Negative perception of management attention
 - Developed over time
 - Management asks:
 - “How did this happen?”
 - “Who is to blame?”
 - Staff feels need to justify actions
 - It’s about ***perception***
 - Management intent less important
 - Can come from simple choice of wording
 - E.g., “Why...” vs. “What...”
- Result: Stifled communication up the chain
 - Problem ID to management delayed
 - Problems become bigger
 - Less time to resolve



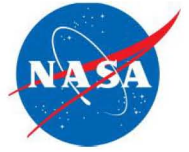
Management Attention: Help or Punishment



- Getting past negative perception of management attention
 - Don't turn open meetings into interrogations
 - Address performance failings in private and as positively as possible
 - Ask good questions
 - “What is needed to make progress?”
 - “What help do you need?”
 - Choose words carefully – don't put messenger on defensive
 - Expect problems to come with potential solutions
 - “If we could _____ then...”
 - Help when your help is needed!!
 - Facilitate solutions to problems quickly
- Only demonstrated “real” help will drive change in perception



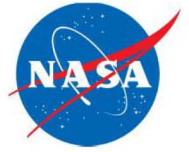
Synchronizing vs. Micromanagement



- Issue: Management control over when work is active may be perceived as micromanagement
 - Particularly true in:
 - Research organizations
 - High grade, independent thinkers
 - Level of effort funding models
- Result: Work goes “underground”
 - Natural urge to “keep the plates spinning”
 - Desire to get ahead on work
 - Desire to stay busy
 - Desire to show progress to customers

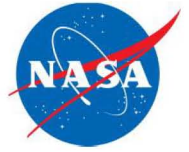


Synchronizing vs. Micromanagement



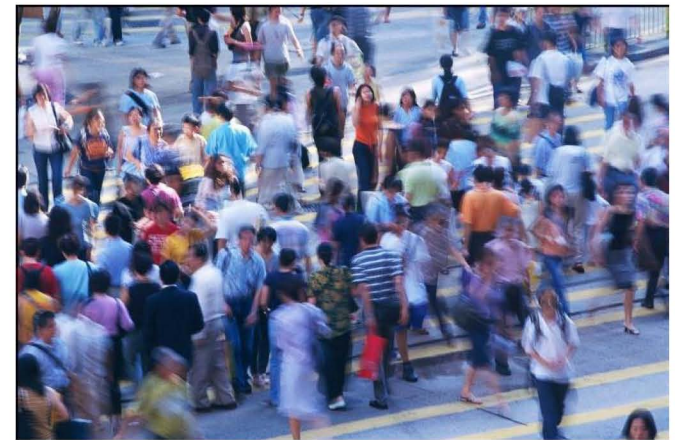
- Getting past the perception of micromanagement
 - Set the right goals
 - Must stretch
 - Must show noticeable progress
 - Near term vs. long term
 - Demonstration of results
 - Individual satisfaction
 - Reduced multitasking
 - Improved performance
 - Corporate performance
 - Increase completion rate
 - Reducing lateness
 - Enforcement, while necessary, won't alter perception quickly
- The change must provide some tangible evidence of benefit in the near term



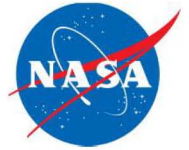


My Project vs. My Center

- Issue: Focus on/allegiance to project team
 - Esprit de corps
 - Budget driven “ownership” of staff
 - Faltering project seen as that teams fault
 - Lack of technical depth
 - Specific project knowledge
 - Broader discipline knowledge
 - Real potential safety impact!
- Result: Reduced staff flexibility degrades overall center performance



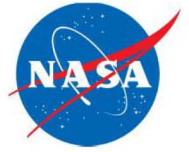
My Project vs. My Center



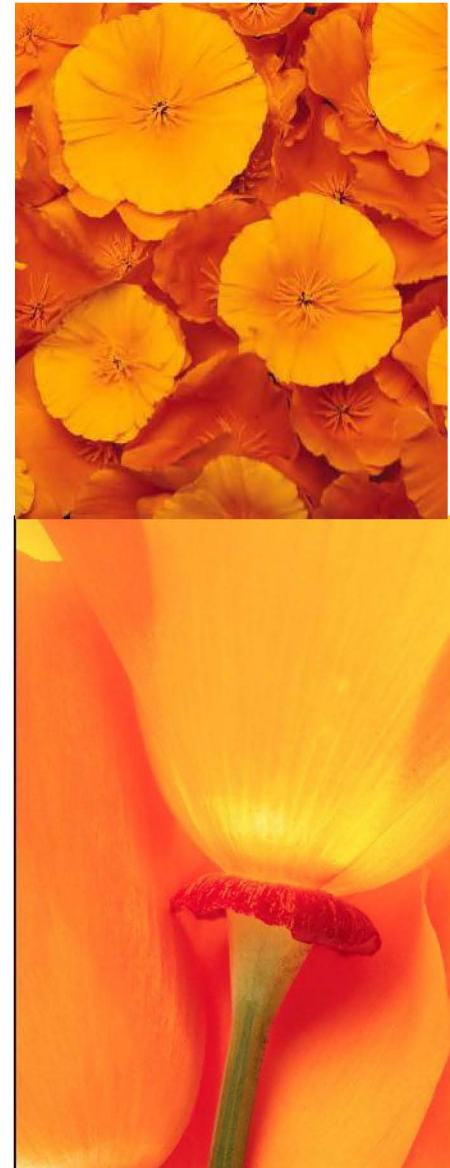
- Getting past excessive focus on and allegiance to project teams
 - Choose right metrics
 - E.g., Center lateness vs. project beating deadline
 - Choose wisely to drive desired behaviors
 - Balance of safety, quality, cost, and schedule
 - Recognize and reward the right behaviors
 - Sacrificing some schedule reserve for the benefit of the center
 - Move to another project that is falling behind
 - Address the issue of technical depth
 - Training, phase the work, etc.
- Ownership of larger organizational success critical but don't let staffing flexibility degrade safety



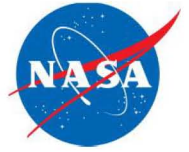
Focus on Minutia: Paralysis by Analysis



- Issue: Attempting to address every detail or contingency during change implementation
 - Differences in sub-organization operation
 - Imagined post-implementation problems
- Result: Management and change implementation team workload skyrockets, change implementation stalls & possibly fails
 - Difficulty making decisions
 - Endless analysis/test cycle



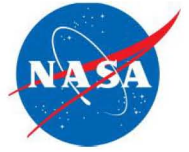
Focus on Minutia: Too Much Depth Leads to Drowning



- Getting past excessive focus on minutia
 - Put most energy on “show stopper” issues prior to implementation
 - Accept that problems will surface during implementation of change
 - Impossible to design out every issue
 - Don’t demand excessive detail before approving initial implementation
 - Have plan & capacity in place to receive and act on problems after “go-live”
 - Help line to collect questions & problems
 - Coach and revisit pre-implementation training
 - Triage problems & act quickly to resolve those of significance
 - Team must include people who have performed the effected functions & understand the change being implemented
- Actual exercising of the change will identify the real problems that need attention



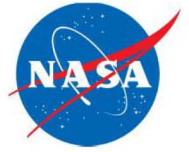
Phased Implementation: Change Schizophrenia



- Issue: Some parts of organization operate under new system and parts operate under old system
 - Test the change
 - Find and fix problems on small scale
 - Need to train everyone
 - Need to know philosophy before they can operate under new rules
 - Unable to muster resources to implement entire organization at once
- Result: Conflict between 2 inherently non-aligned systems
 - Prolongs the change
 - “Why do I/we have to do this if they don’t?”
 - Tough on shared resources
 - Management has to make decisions based on 2 rule books
 - Extra resources required to deal with system conflict issues



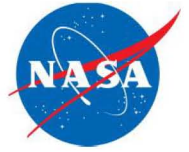
Phased Implementation: Change Schizophrenia



- Avoiding phased implementation conflicts
 - Avoid phased implementation if you can
 - Execute the phases in quick succession if you must
 - Carefully define the “control volume” of necessary phases
 - Minimize operating in and out of the change
 - Err on the side of over estimating required implementation resources
 - Eliminate old processes, procedures, ways of doing business as quickly as possible
- Once decided, move aggressively to implement change throughout the organization
 - Get past the tipping point
 - Execute the change like you mean it!
 - Pockets of “old ways” will put drag on the change



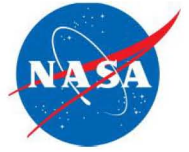
Long Term Attention: Organizational Attention Deficit Disorder



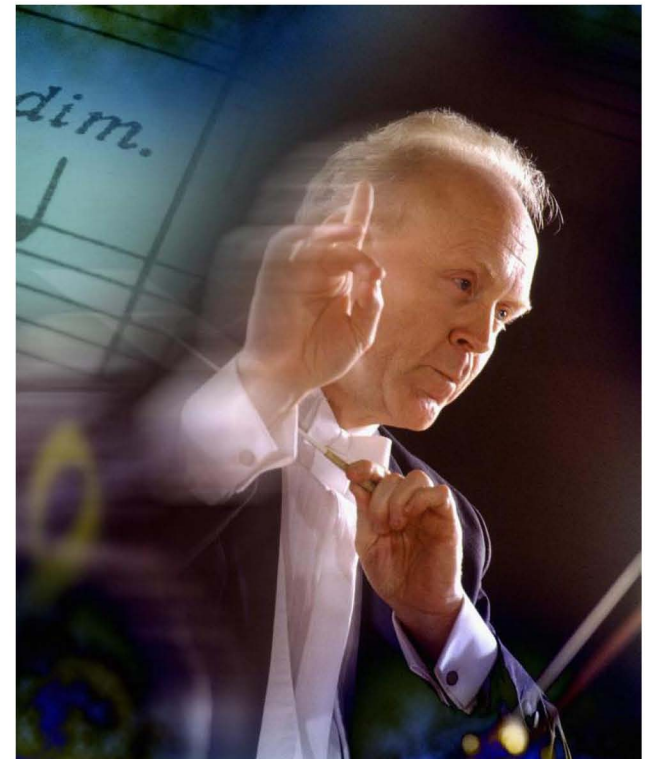
- Issue: Many demands on organizations management
 - Budget issues
 - Staff issues
 - Demands from HQ
 - Meeting upon meeting
 - Ad-hoc implementation team may be in place
- Result: Management attention and visibility regarding change wanes
 - Difficulty getting needed approval/decisions
 - Lack of ownership of implementation design
 - Staff question management commitment



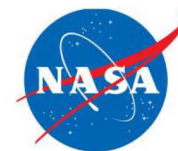
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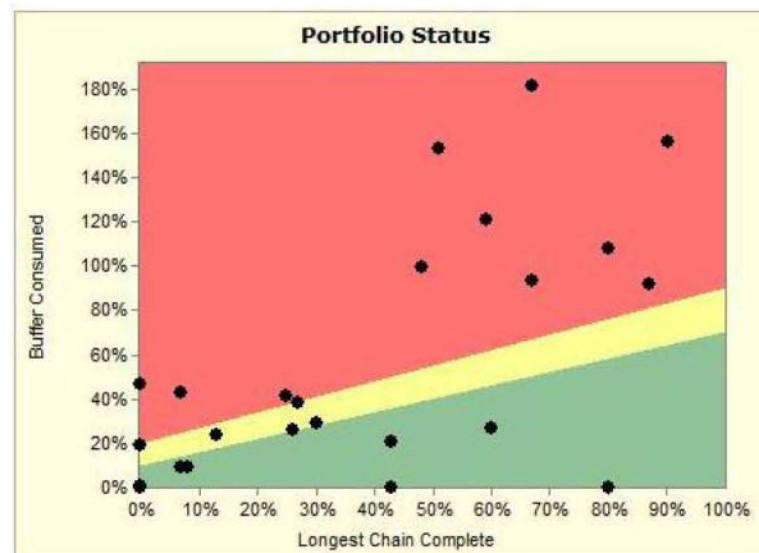
- Motivating Long Term Focus & Attention
 - Make a senior manager & their organization responsible for implementation & sustainment functions
 - Still create ad-hoc implementation team
 - Architect of the implementation w/senior manager
 - Membership from across impacted organizations
 - Line organization(s) responsible for long term support must be full partners in designing implementation
- The organization will focus its attention where the leaders focus their attention
 - Organization management must remain engaged in the change & take on their new roles
 - Only organizational management has **authority** to change the underlying rules, processes, procedures, etc.



Current State

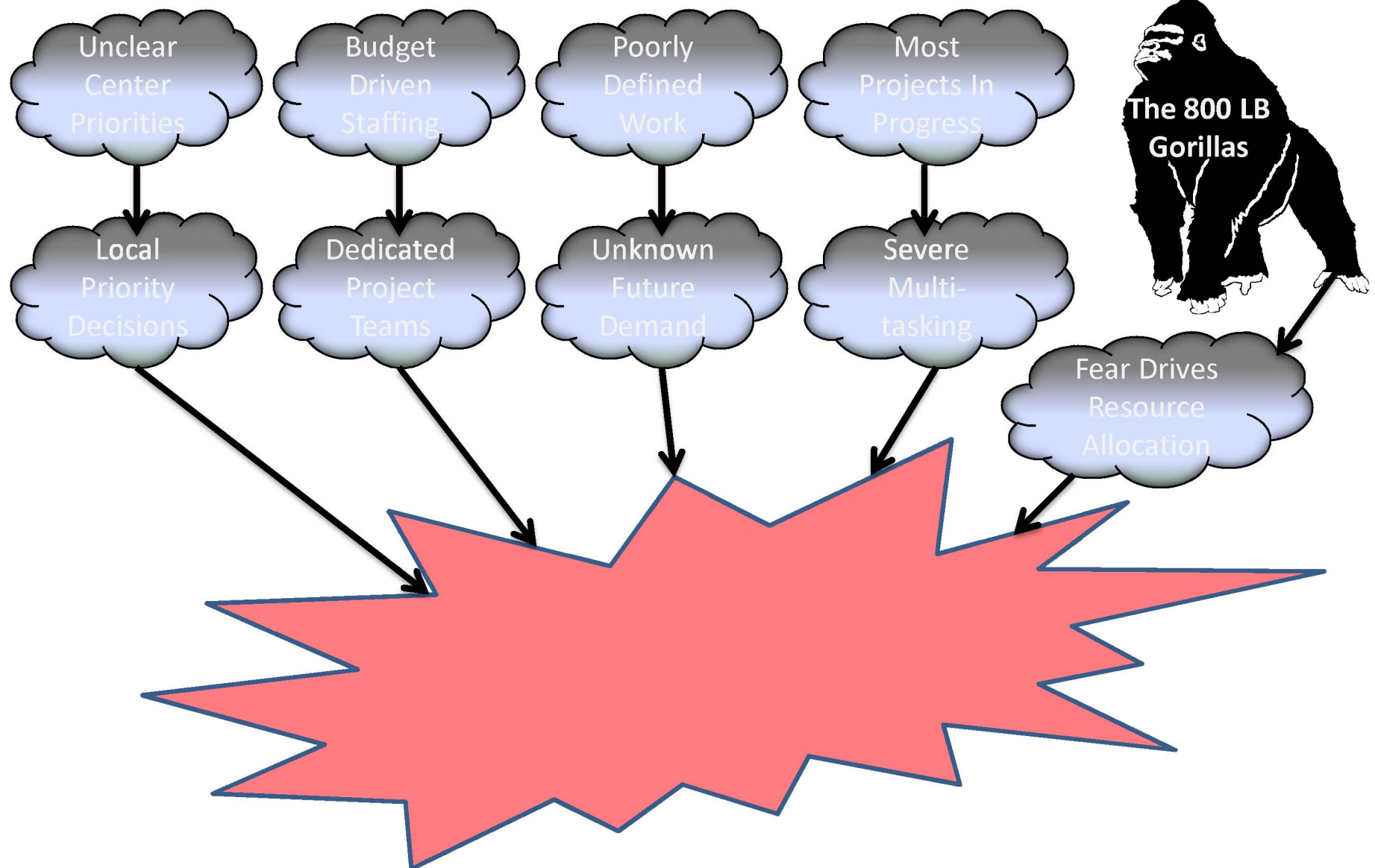
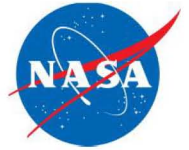


- Management has taken ownership of the change
- Implemented in ~50% of projects
- More knowledge based decision making
- Success has been observed where philosophies have been applied
- Generally satisfied with progress
 - Still long way to go



Resource Hierarchy		Load vs Capacity (%)	Total L:C	Peak L:C	Max Cuml L:C	Max Cap	Week1 (12/23/2011)	Week2 (12/26/2011)	Week3 (1/2/2012)	Week4 (1/9/2012)
RS			72%, 18.7[3,3,12.7,0]26	91% [23.7]26	91% [23.7]26	26	0%, 0[0,0,0,0]0	0%, 0[0,0,0,0]0	91%, 23.7[4.7,3,16,0]26	63%, 16.5[2.8,3,10.6,0]26
RS-Thermal Structures			130%, 6.5[1.8,2.2,7.0]5	160% [8]5	133% [20]15	5	0%, 0[0,0,0,0]0	0%, 0[0,0,0,0]0	160%, 8[3.2,3,0]5	120%, 6[1.8,2.2,2.0]5
RS-Aerodynamic Loads			88%, 1.8[0.0,1.8,0]2	117% [2.3]2	117% [2.3]2	2	0%, 0[0,0,0,0]0	0%, 0[0,0,0,0]0	117%, 2.3[0.0,2.3,0]2	60%, 1.2[0.0,1.2,0]2
RS-Structural Dynamics			59%, 7.1[1.1,5.0]12	73% [8.7]12	73% [8.7]12	12	0%, 0[0,0,0,0]0	0%, 0[0,0,0,0]0	73%, 8.7[1.1,6.7,0]12	52%, 6.3[1.1,4.2,0]12
RS-Static Structures			24%, 3.4[0.2,0.3,3.0]14	33% [4.7]14	33% [4.7]14	14	0%, 0[0,0,0,0]0	0%, 0[0,0,0,0]0	33%, 4.7[0.7,0.4,0]14	21%, 3[0.0,3.0]14
RS-Structural Sensors			0%, 0[0,0,0,0]5	0% [0]5	0% [0]5	5	0%, 0[0,0,0,0]0	0%, 0[0,0,0,0]0	0%, 0[0,0,0,0]5	0%, 0[0,0,0,0]5

Current State

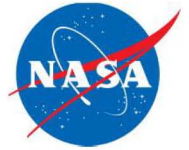


Current State



- Implementation of Critical Chain Project Management Tools & Philosophies
 - Fundamental shift in center management and project execution philosophies
- Goals
 - Reduce multitasking
 - Reduce workforce stress
 - Improve on-time performance
 - Improve time for training, R&D, infrastructure improvement, etc.
- No significant change in size of center workforce
- Tools & processes generally in place
 - In need of documentation
 - Philosophy is slowly taking hold
- Progress toward goals
 - Multitasking reduced but still too high
 - Workforce stress is up due to change
 - Projects still run late but more focus and commitment to figure out why & fix
 - No real change in time for training, R&D, etc.
- Workforce is about same size to slightly smaller

Conclusion

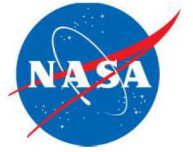


- Substantial, sustainable, improvements in performance come from fundamental changes in how people think about and execute their jobs
 - From the most senior leader to the most junior employee
 - Tool and process changes are necessary but not sufficient
 - Policing use of new tools and processes also necessary but not sufficient
- Don't underestimate the resources required to implement the change
 - Implementing new tools and processes is relatively easy
 - Changing how people think is time consuming and hard
 - Build the implementation team with sufficient breadth and depth

Conclusion



- Once the change is launched, execute implementation quickly
 - Discard old tools and processes as quickly as possible
 - Make the new philosophies and tools **the** way the organization operates
 - Minimize the number and length of implementation phases
- Choose goals, metrics, & rewards carefully
 - Goals need to stretch but be achievable & of value to all
 - Set expectations appropriately regarding timeline for achievement of goals – real change takes time & is messy at first
 - Metrics and rewards (recognition) drive behavior of the organization
- Senior managers must lead the way
 - Managers and their organizations must execute the change
 - They must own it and demonstrate the change through action
 - Their questions must force people to think about going forward into the change, not looking back to justify actions



Thank you for your Attention

Questions?